GUYSOL

March 2023

Guyana Utility Scale Solar Photovoltaic Program

Project Summary – Hampshire

Berbice

The Guyana Power and Light

103 Carmichael Street,

North Cummingsburg,

Georgetown.

PROJECT SUMMARY – Hampshire

- ***A detailed description of the proposed project, including:***
    - ***i. Physical location and its characteristics along with GPS coordinate/s; where applicable distances from the closest town, settlement, indigenous community, and nearby waterways such as creeks, rivers, closest town, etc; general/predominant land use (residential, tourism, agricultural, commercial, industrial, etc.) of the area; sensitive receptors (daycare facilities, schools, hospitals, etc.) likely to be affected by the proposed project; the relative abundance of natural resources in the area; and the non-disputed nature of the land.***

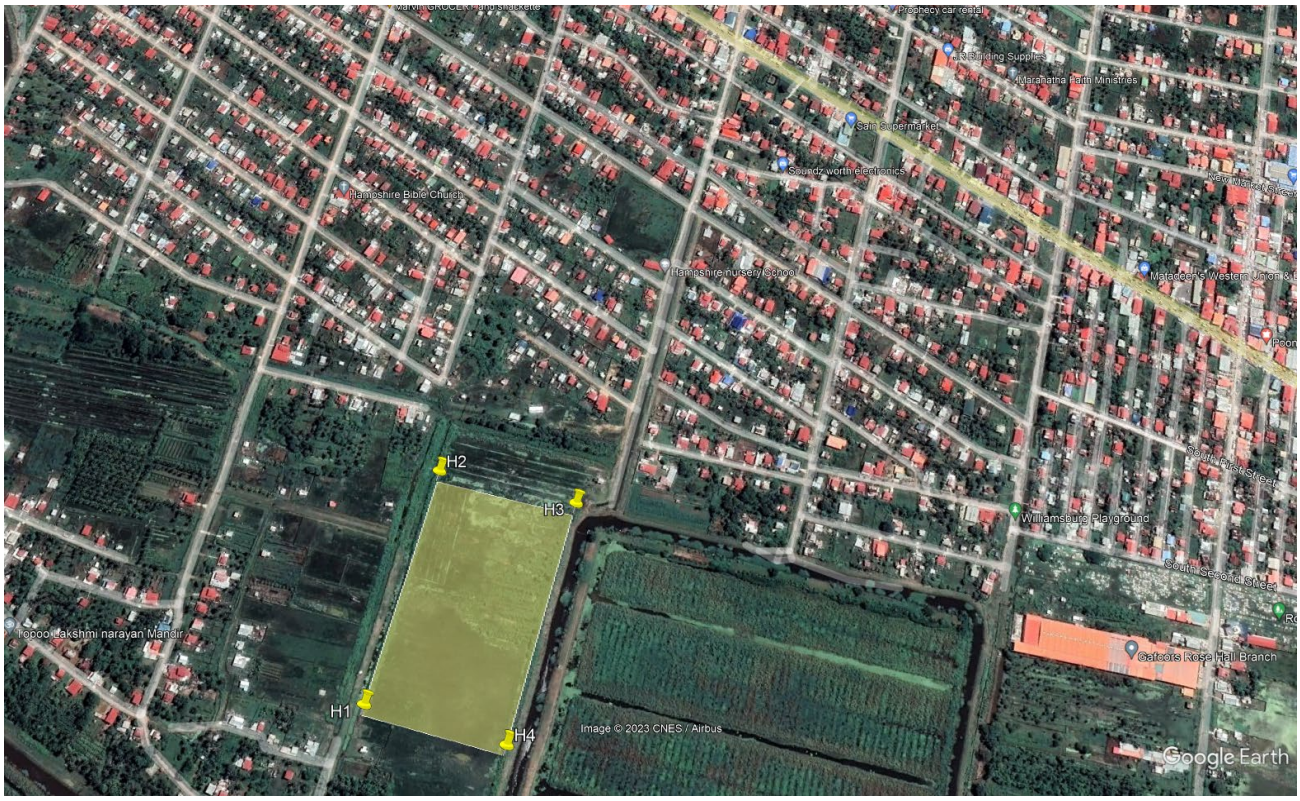
HAMPSHIRE - BERBICE

Three solar farms are proposed for the Berbice region – Hampshire, Corentyne being one such. Hampshire will boast 3MWp and is proposed to interconnect to the Canefield F3 13.9kV load feeder via a short 13.8kV line. Although the farms will be a part of the DBIS and satisfy a fraction of the demand of the DBIS, it will support the distribution network and reduce losses by supplying power closer to the load.

Tract GPL 1 being a portion of Lot 260 Block 7, Government Land is proposed for the solar PV farm that is situated at Plantation Hampshire on the East Coast of Berbice in the county of Berbice. The area is documented as swamp lands with low bush. Immediately west of the site is a dam, continuing in this direction (west/north-western) are several residences (from 0.19km). Residences are also located within the south by west boundary of the site commencing from 0.03 km and beyond. According to the Cadastral Survey conducted, an area of the site, in the south-southwest direction is occupied by a building in the name of Kamla Edwards, which indicates that are several residences within the area of indirect influence of the project site. Furthermore, three (3) informal structures were noted during the social survey within the area of direct influence of the project site, two (2) of which were occupied. The third is incomplete. At the east/south-eastern boundary, there is a dam preceded by a drain. In the north by east direction of the site, there is land which is occupied by homes (from 0.11km).

Within proximity to the site in the north/north-eastern direction, is the community of Hampshire with several services available including the Hampshire Nursery School (0.37km from the boundary), two churches, an auto repair shop, two general stores and hospitality services (hotel, bar, food and clothing.

The Hampshire site can be accessed by the Corentyne Public Road via the junction. There is an established asphalted road and a dirt road. The Contractor will be required to upgrade approximately 250m of dirt road to establish the required access to the project site. The hampshire site can be found at Latitude 6.251665° and Latitude -57.365488°.



Map showing the location of the Hampshire Site

ii. A description of all feasible and reasonable alternatives.

As a result of the issues discovered at the Belvedere Site on May 14, 2021, the GLSC identified an alternate area in Hampshire, Corentyne to the south of the public road. Visits made on May 14, 2021,

revealed that the land is of good quality and there is no indication of competing interests. Accordingly, the lease for this site was obtained in February 2022.

iii. Description of any existing baseline information on the physical (landscape, soil, water, air, the use of natural resources), ecological (flora and fauna), and social environment (economic and cultural aspects).

Based on the ESA carried out the following existing baseline information was gathered:

PHYSICAL ENVIRONMENT -

a) LANDSCAPE

Hampshire falls on the Coastal Plain, one of Guyana's five physiographic region. The Coastal Plain occupies 8.5 percent of the total land mass or an area of 18,033 km^2. It is a narrow belt (ranging between 8 and 65km in width with a length of 440km) stretching from the Corentyne River in the east to Waini Point in the west and providing most of the agricultural production in the country.

East of the Essequibo River, the plain consists of recent and old sediments with recent deltaic and fluvio-marine clays and silts occurring on the coast with silty clays and sands inland. The recent plain occurs at elevations of 2m below to 3m above sea level with sandy old beach ridges forming higher ground. The older coastal plain lies at an altitude of about 3-9 m above sea level. The normal tidal range is about 3m with resultant flooding (particularly sea invasion) especially during the wet seasons from April to August and November to January and during high tides.

Many areas of the coastal plain are below sea level while other areas are manufactured and built-up to raise them above the surrounding land level. An elaborate system of sea defences, along with irrigation and drainage canals, is required to protect the area from flooding. West of the Essequibo River, the coastal plain narrows with extensive organic wetland 'pegasse' deposits inland. While these are most extensive in the west of the country primarily in Regions 1 and 2, they also occur scattered between the Essequibo, Demerara and Berbice Rivers. East of the Berbice River, the

pegasse area is small and the coastal ‘frontland’ and ‘riverain’ clays relatively wide.

b) SOIL

The coastal plain is part of the flat, low-lying coastal lands that extend along the coast of South America from the Amazon to the Orinoco. The plain is composed of a wide variety of soils developed from a variety of parent materials such as marine and fluvio-marine deposits with back-swamp organic soils. In general, the soils closer to the shore and along rivers are more fertile than the soils behind which can have extremely low fertility and toxicity in some instances. The soils have been mapped as:

- **1a**- Low humic gleys of high base status, marine phase "frontland clay" (Hydraquents with Sulfaquents, Fluvaquents)
- **2a**- Low humic gleys of high and medium base status, fluvio marine phase, riverain soils (Fluvaquents with Endoaquents, Medhemists)
- **3a**- Bog soils, peat and muck phases, deep pegasse (Medihemists with Sulfohemists, Medisaprists)
- **4a**- Low humic gleys of low base status, including groundwater laterites and planosols (Endoaquepts with Fluavaquents, Sulfaquepts)
- **5a**-Groundwater laterites (Humaquepts with Endoaquepts, Fluvaquents, Psammaquents)

1a Low humic gleys of high base status, marine phase "frontland clay" (Hydraquents with Sulfaquents, Fluvaquents)

This mapping unit occurs on the coastal plain of eastern Guyana from the Essequibo to the Corentyne river stretching some 32km inland in places. It contains fertile, poorly drained clay soils developed on unconsolidated sediments with associated sandy ‘reefs’ that are old beach ridges. Some saline soils and organic ‘pegasse’ soils also occur in patches. The soils need drainage prior to agricultural production but are fertile. The main limitations for agriculture are the need for drainage and occasional areas of salinity and acid sulphate and aluminium toxicity. In much of the coastal plain, these soils have a land use of rice and sugar with coconuts on the sandy reefs. In cases of no agricultural development, the vegetation is one of mangrove and swamp forest and marshy grassland.

2a Low humic gleys of high and medium base status, fluvio-marine phase, riverain soils (Fluvaquents with Endoaquents, Medhemists)

This mapping unit describes poorly drained, deep, silty loam to silty clay over clay textured soils that have developed over alluvial deposits. They occur between the Berbice and Corentyne rivers, along the Demerara River as far south as Linden and 100km up the Berbice River and at the Essequibo River mouth. The soils have moderate to high fertility which decreases away from the coast. The need for drainage is the main limitation. The soils are extensively cultivated with rice and sugar as the main crops but with a natural vegetation like 1a where not cultivated.

3a Bog soils, peat and muck phases, deep pegasse (Medihemists with Sulfohemists, Medisaprists)

These organic bog soils known as 'pegasse' occur as coastal back-swamps and are most extensive in north-western Guyana, west of the Pomeroon River where they can extend 65km inland, although they also occur in patches behind the rest of the coastal plain. The soils are organic accumulations of peat and other organic matter occasionally interlayered with clay and can be as deep as 9m. They are very acid and have extremely low fertility. Drainage, fertility and acid sulphate toxicity are the main limitations to agriculture. The land cover is mainly natural vegetation of grassland and swamp forest with characteristic ite palms.

4a Low humic gleys of low base status, including groundwater laterites and planosols (Endoaquepts with Fluavaquents, Sulfaquepts)

This unit represents a complex of different soils in which Low Humic Gleys (Endoaquepts) are predominant. The unit occurs primarily in the backlands of the Mahaica-Berbice area, between the Berbice River and Canje Creek and in small patches between the Essequibo and Demerara rivers. The soils are very poorly drained clays often with a peat topsoil with better drained laterite 'islands' and planosols that show an abrupt silt pan. The soils have extremely low fertility and often exhibit acid sulphate and aluminium toxicity. Drainage, fertility and acid sulphate toxicity are the main limitations to agriculture. The land cover is mainly natural vegetation of scrub, waterlogged grassland/marsh and swamp forest.

5a Groundwater laterites (Humaquepts with Endoaquepts, Fluvaquents, Psammaquents)

This mapping unit occurs at the boundary of the coastal plain and the White Sand Plateau and is most extensive between the Berbice and Demerara rivers and south of the Torani Canal in Region 6. The soils are poor to moderately well drained, deep silty clays to clays of low fertility. Drainage is the main limitation in some areas, but the low fertility can be enhanced through appropriate land management. The land cover is largely forest with some areas of savanna.

c) ***WATER QUALITY***

This area is about 40,850 km2 or 19 percent of the country and lies within the eastern part of the country with Suriname on the eastern border by the Corentyne river. Surface water occupies about 20 percent of the region and lies along the Corentyne, Canje, and New Rivers which have enormous quantities of fresh water year-round. About 40 percent of the region, mainly the interior plains, has enormous quantities of fresh water available from April through August and November through January, with large to very large quantities available the rest of the year. In about 30 percent of the region in the southern uplands, large quantities of fresh water are available from April through August, with meagre to moderate quantities available the rest of the year. Most of the population centres are on the coastal lowlands in the northernmost part of the region. Numerous existing wells are in this area, and ground water exploration is recommended. The best aquifer in the system is the A Sand. The rest of the region, which is south of the coastal lowlands, is likely inaccessible due to lack of roads. The White Sands Formation lies in this region, which consists of unconsolidated sand that yields moderate to large quantities of fresh water.

d) ***AIR QUALITY***

The $PM_{2.5}$ concentration at the Hampshire solar PV farm site ranged from 10.7 - 18.2 g/m^3. The latter was measured at HAM-08, however, the levels are within the permissible levels outlined by the US NAAQS 24-hour average. Similarly, PM_{10} levels did not exceed the limits stipulated by the US NAAQS with the maximum reading at HAM-04 (23.6 g/m^3). Overall, the current baseline air quality within the area is good. The site did not contain any total volatile organic compounds.

e) NOISE LEVEL

At the proposed solar PV site in Hampshire (see Map 3-15), the noise level did not exceed the limits specified by the EPA Guyana (Table 3-3). The highest dB was noted at Ham-10 which was recorded 48.4 dB (HAM-10).

ECOLOGICAL ENVIRONMENT –

i. FLORA – Region 6 East Berbice Corentyne (Hampshire)

This region is characterized by cultivated lands on the coast. The vegetation in this region is:

A. Flooded coastal and lowland forests:

Low Low/medium, evergreen, flood palm marsh forest

Coastal/lowland 0-100m, macro thermic, ombrophilois, 5-12 (30)m tall

Pterocarpus – Maximiliana on alluvium (E District)

B. Non-flooded lowland forest on white sand:

Tall, evergreen, sclerophyllous forest (Wallaba forest)

Lowland 10-400m, macro thermic, ombrophilous, 25-35m tall

Eperua - Eperua

C. Riparian forest:

Tall, evergreen, flooded riparian forest (include. Mora forest)

Lowland, 0-400m, macro thermic, omborphilous, 30-45m tall

Mora Exceisa, Carapa, Simaruba

A. Savannas and meadows:

Herbaceous swamp

Coastal/lowland 0-400m, macro thermic, 1-4m tall, perennial

Cyperus, Montrichardia, Sagittaria, Typha, Mauritia

Like the proposed area for the Trafalgar solar PV farm, the site for the Hampshire solar PV farm is regarded as cultivated/residential area. Surrounding land uses indicates the presence of residences, however, the actual proposed area is regarded as swamp lands by the Guyana Lands and Surveys Commission.

Species occurring at the proposed solar PV site for Hampshire include:

SPECIES NAME	COMMON NAME
Nelumbo nucifera	Pink lotus
Pennisetum purpureum	Elephant Grass
Brachiaria arrecta	Tanner Grass
Setaria anceps	Monkey tail

ii. FAUNA

Most of the species recorded during the surveys were listed as Least Concerned (LC) or Non-CITES according to IUCN/CITES. Overall, no ecologically significant or critical habitat was found at the proposed sites, so there is no risk of disturbance to any critical habitats. No endemic species were found inhabiting the proposed sites, a few species were CITES listed and most were LC Least concern.

SOCIAL ENVIRONMENT -

a) ECONOMIC ASPECT

Hampshire is a village located on the Corentyne coast of Berbice, Guyana. It is bordered by the village Belvedere to the west, and the village Williamsburg to the east. To the north of the village is the Atlantic Ocean, and cane fields are located to the south. During the social survey conducted for Hampshire, the presence of three informal settlers were observed at the boundary of the proposed solar PV site. According to the census conducted in 2012, the total population of Hampshire is 1823 people.

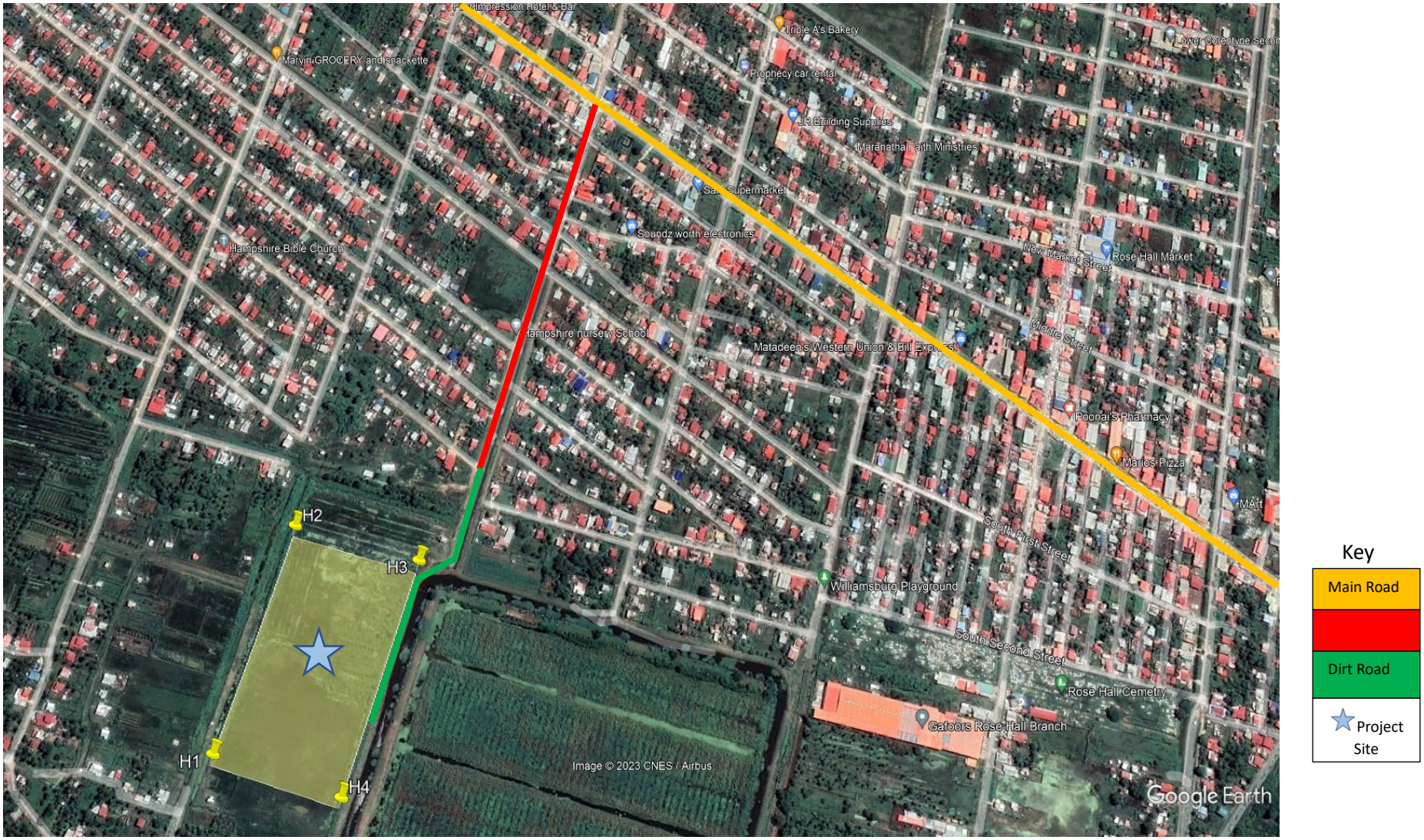
It was found that residents held qualifications ranging from primary to tertiary. Majority of residents, 61.3% completed a secondary education (40% females and 21.3% males), while 26.3% completed primary education (18.75% females and 7.5% males). Sixth form and tertiary level of education accounted for 6.3% each. Assessment of employment status revealed 28.8% of respondents were unemployed. This consisted of 16.3% females, and 12.5% males. On the other hand, 21.3% of residents were found to be employed, consisting 15% of females, and 6.25% males and 5% of the population were retired. Majority of women noted housewife as the most common

job.

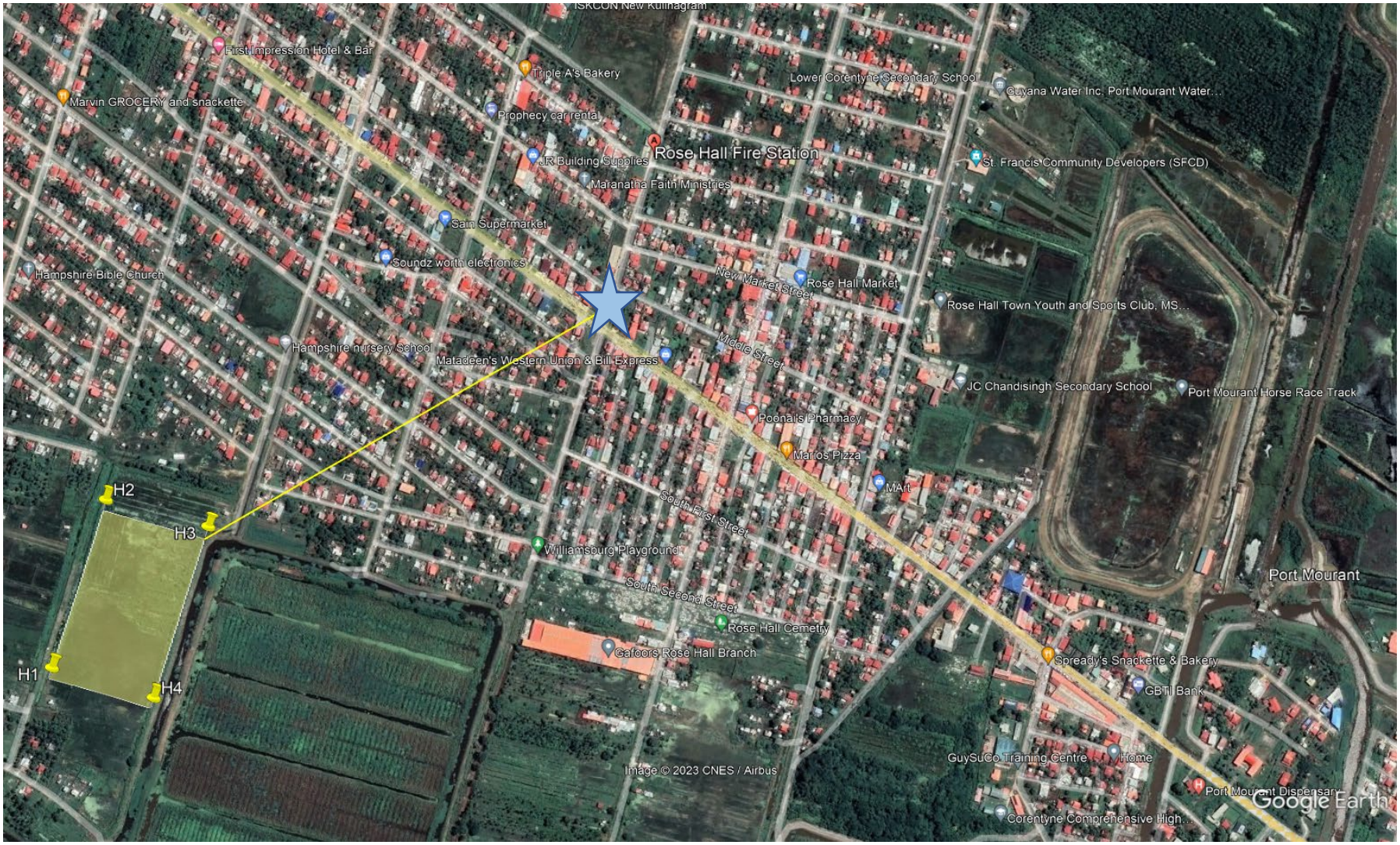
The average monthly income of each household ranged from $54,000 – $174,000. The largest percentage of residents (45%) earned between $55,000 to $94,000 whereas, 23.8% earned between $95,000 to $134,000. Moreover, 21.3% earned less than $54,000, and only 10% earned between $135,000 and $174,000. There were no indication of persons earning above$175,000. Based on the survey, an average of 21.3% of the households are working below a monthly income of $55,000 and would therefore be considered low-income earners.

In the community, 96.3% of respondents indicated that lack of employment was the main social issue. Meanwhile, the remaining 3.8% indicated this to be poverty. The respondents had no indications of any problems with crime, discrimination, or any other social issues. The residents of Hampshire stated there were no incidents of sexual abuse or gender inequality in the area. However, 6.3% of the population indicated domestic violence as an issue. Concerning the level of social cohesion, 50% of the respondents indicated that the community had an average level of cohesion, whilst 41.3% indicated good levels, and 8.8% were unsure of the level of community cohesiveness. Of the 80 households surveyed, 96.3% stated that there were no opportunities for local employment, whilst 3.7% were uncertain.

iv. Layout of the project, presented on a map with a scale relevant to the size of the development with the following details:



b. The closest town is Rose Hall, which is approximately 0.5 miles from the project site.



Rose Hall Town

3. ***A description of the design of the proposed which shall include:***

a) ***Design\construction drawings, specification of any structures, volume of expected pollutants, etc.***

The construction drawings are currently being developed and as soon as they are accepted and approved, they will be submitted to the agency.

b) ***The project size, e.g. capital investment, number of employees projected for each stage of the project, rates of production, transportation route etc;***

The Capital investment for the entire GUYSOL project is 83.3 million united states dollars. The number of employees is yet to be determined. It is estimated that this project site will have an output of 3MWp.

c) ***Activities associated with all development stages from construction to closure:***

a. ***operation and production processes and alternative design/s considered.***

Response: This will be provided when the information is available.

b. ***a guide for all stages of the project from raw material to the finished product.***

Response: This will be provided when the information is available.

c. ***technical description of the proposed project's process/activity accompanied by a Process Flow Diagram/s;***

Response: This will be provided when the information is available

v. ***Use of Natural Resources: approximate quantities of raw materials required at each stage of the project and their possible sources;***

Response: This will be provided when the information is available.

vi. ***Source of utility services such as water supply and treatment options, energy/electricity and communication facilities;***

Water will be suppled from GWI, while transmission lines will be established from the nearest transmission lines to the site to facilitate the flow of the power produced from the solar farm back in to the grid.

vii. Waste production: types of waste, the monthly quantity/volume of waste managed (generated, stored, transported), the volume of effluent to be discharged along with a chemical analysis indicating the effluent's composition and methods of waste disposal/treatment. Potential locations for recovery/disposal sites shall be* identified *with justifications for the site selection;

The only type of waste that will be produced will be domestic waste. This is be disposed of by a hired servicer provider.

viii. The duration of the project for each phase; and

Response: This will be provided when the information is available

ix. Decommissioning plan (where applicable).

Response: This will be provided when the information is available

x. Potential Impacts and their Significance

xi. An assessment of the potential impacts of the proposed development and its significance in relation to:

a. <u>the extent of the impact or the area of influence: the geographical area that may be affected by the proposed activity and the manner in which the various aspects of the environment: physical (landscape, soil, water, air, the use of natural resources), ecological (flora and fauna), and social (economic and cultural aspects) may be impacted;</u>

Site	Construction Phase	Operation	Decommissioning
	Dust generation		
Hampshire	Dust generated during projects works is expected to be brief, frequent and localized. It will be attributable to site preparatory works mainly involving heavy machinery (clearing, levelling, excavation, grading). This impact is considered minor as it is site specific and short term. Effects are mitigable.	This impact is not likely to occur during operation.	This is expected to be brief, frequent, and localized due to dismantling of the site and use of heavy machinery (clearing, levelling, excavation, grading). This impact is considered minor.
	Reduction of carbon emissions (+)		
	This impact is not likely to occur during construction.	There is an expected long-term reduction of Greenhouse gas emissions. Given the current and projected loads at each site, the Berbice component is	This impact is not likely to occur during decommission.

		expected to save a total of 10,671 tCO2 annually. The generation of energy through the PV system provides a source of green power generation and significantly reduces dependence on fossil fuels. The impact is considered major.	
	Nitrogen and Carbon oxides emissions		
	This is expected to be brief and localized due to the operation of light and heavy vehicles, transportation trucks, generators, compressors and other construction equipment. This impact is considered minor.	The process of generating electricity from a solar power plant does not emit any harmful Greenhouse gases and/or waste products. since substation only distributes power. The impact is considered insignificant.	This is expected to be brief and localized due to the operation of heavy machinery, transportation trucks, generators, compressors and other construction equipment. The impact is considered minor.

Site	Construction Phase	Operation	Decommissioning
	Noise level		
Hampshire	The presence of and operation of light and heavy vehicles, transportation trucks, generators, compressors and other construction	This phase will produce localized low levels of noise due to operation of electrical components of the PV plant,	Brief, frequent and localized elevated noise levels due to dismantling of facilities, increased vehicular traffic, and

	equipment will generate noise; however, this impact is considered low as it is expected to be brief, frequent and localized.	maintenance activities, and vehicular traffic. The impact is considered minor.	movement of equipment. This impact is considered minor.

Site	Construction Phase	Operation	Decommissioning
	Loss of topsoil		
Hampshire	Loss of topsoil		
	Long-term and localized loss of topsoil during site clearing and preparation activities is expected, however this site was used as farmlands therefore the topsoil was already disturbed. The impact is considered localised, short-term and minor.	This impact is not likely to occur during operation.	Removal of facilities and supporting structures will disturb topsoil once more. This is considered minor as it is short-term and localised.
	Soil compaction		
	Long-term and localized soil compaction may cause soil erosion and surface water runoff and	This impact is not likely to occur during operation.	This impact is not likely to occur during decommission.

	riverbed silting. Effects can be minimized with adequate mitigation measures. The impact is considered localised, short-term and minor.		
	Soil contamination		
	Brief and localized soil contamination due to oil spills or other hazardous substances. Effects can be avoided with adequate mitigation measures. The impact is considered localised, short-term and minor.	With adequate mitigation measures in place, this impact will not be likely.	Brief and localized soil contamination due to oil spills during dismantling activities is expected. Effects can be avoided with adequate mitigation measures. This impact is considered minor.
	Soil erosion		
	Erosion/disturbance of the soil is expected during construction from activities including land clearance and assembling of foundation structures for mounting of solar modules. Potential impacts associated with transmission line infrastructure is minimal since the site has established lines. The scale	Erosion of the soil may occur during this phase due to vehicle movement which will only happen during the occasional maintenance activities. Furthermore, water that falls on solar PV panels run down the panel to the dripline to the soil which may potentially cause localised erosion. This impact has the potential to be	During this phase, this impact is likely from the removal of infrastructure like mounting structures, however, if land cover is maintained throughout operation and soil is put back after removal, the potential for this impact is significantly reduced. This impact is expected to be low due to its occurrence at specific localised

	is localized at activity areas. This impact is considered minor and temporary.	moderate however, with adequate mitigation measures like ground cover and proper drainage to manage runoff this is likely to be reduced to negligible/low risk.	areas and existing erosion control measures from operation.
Hampshire	The site is 30 acres of state-owned land. The current land use of the land can be considered as commercial/industrial. The installation of the PV systems will not significantly impact the economic activities of the communities and the surrounding area. The impact is considered minor. Current land use of the right of way (ROW) which are also road reserves commonly used for installation of infrastructure networks such as the one recommended for the Project. The new transmission lines for	The site will be used for energy generation for the lifetime of the facility. There is no significant change in the land use of the site. The installation of the PV systems will not significantly impact the economic activities of the area. The impact is considered insignificant.	The farm will be dismantled, and the facilities removed. The future site use shall be in line with the land use of the area or be restored to its initial stage. The impact is considered minor.

	interconnection of PV Farm to the grid and substations will be done within the existing right of ROW. Therefore, there is no expected modification of the current land use of the proposed transmission lines. It is proposed that the Hampshire Solar Farm be interconnected to the Canefield F3 13.9kV load feeder via a short 13.8kV line along an existing road. The impact is considered insignificant.		

Site	Construction Phase	Operation	Decommissioning
	Visual landscape		
Hampshire	The installation of the PV system will alter the visual landscape of the project site. The components of the PV system will become a dominant	The PV systems will reflect sunlight and may become a distraction for motorists and aircrafts. The effects can be minimized with adequate mitigation	The decommissioning of the system will reverse the visual impacts at the proposed site. The impact is considered minor.

	feature of the environment. The impact is considered moderate, however, in consideration of the existing land zone (agricultural), it is reduced to minor.	measures. The impact is considered moderate. Conversely, solar PV farms are seen as tourist attractions and often open for school visits and opportunities for training, which reduces this impact to minor.	

Site	Construction Phase	Operation	Decommissioning
	Solid waste generation		
Hampshire	Waste generation will be significant during the construction phase. Minimal to no green waste is expected at this site considering the land is swamp lands and has low grass. Construction and domestic waste generation is expected to be temporary and localized but significant in volume. As an indirect impact, it likely	Domestic waste generation may be expected during operation from permanent maintenance staff. Although the generation will be long-term and localized, the volume generated can be considered low.	Solid waste generated is expected to increase in the decommissioning stage. Solid waste generated is expected to be localized, temporary and significant volume of domestic, scrap metal, construction waste, and hazardous waste.

	that temporal food supply businesses will increase nearby the project site. These businesses will also be a source of increased generation of solid waste that must be considered. Poor solid waste management on site may lead to improper disposal, burning, and pollution of water resources. The effects can be minimized with adequate mitigation measures. The impact is considered moderate.	The effects can be minimized with adequate mitigation measures. The impact is considered minor.	The effects can be minimized with adequate mitigation measures. The impact is considered moderate.

Site	Construction Phase	Operation	Decommissioning
	Surface water pollution		
Hampshire	Construction activities may result in pollution of nearby surface water due to runoff (increased turbidity, organic load). This is expected to be temporary and controlled with adequate drainage	During operation, wastewater will be generated from security/maintenance staff offices and cleaning of the PV cells. The effect is expected to be long term and can be mitigated with	Surface water pollution: Activities may result in pollution of public irrigation canal due to runoff (increased turbidity, organic load). This is expected to be temporary and controlled with adequate drainage at the site.

	and wastewater management at the site. Potential spills of oil could cause contamination of the nearby surface water through run-off. This aspect is temporary and avoidable. Wastewater generation from construction staff living quarters may also cause increased organic load to nearby water bodies, if not adequately managed. The impact is considered moderate.	adequate collection and management practices. The removal of soil cover might generate minor impacts due to erosions during operation also. Potential spills of oil and any other hazardous substances could cause contamination of the nearby public irrigation canals. This aspect is very localized, temporary and easily avoidable. The impact is considered minor.	Potential spills of oil could cause contamination of the nearby public irrigation canals. This aspect is very localized, temporary and easily avoidable. The impact is considered moderate.

Site	**Construction Phase**	**Operation**	**Decommissioning**
	Groundwater contamination		
Hampshire	Groundwater resources may be impacted during the construction stage from oil spills and leaks or due to	Improper solid and wastewater have the potential to negatively impact	Groundwater resources may be impacted during the decommissioning stage from oil spills and leaks or due to

	improper storage and handling. Improper solid and wastewater management can also impact the groundwater resources. The effects are considered temporary and moderate. Adequate measures can avoid potential effects. The impact is considered minor.	ground water resources. Adequate measures can avoid potential effects. The impact is considered insignificant.	improper storage and handling. Improper solid and wastewater management can also impact the groundwater resources. The effects are considered short term and minor. Adequate measures can avoid potential effects. The impact is considered insignificant.

Site	Construction Phase	Operation	Decommissioning
	Creation/loss of natural habitat		
Hampshire	Creation/loss of habitat		
	This project site is considered as swamp lands and no evidence of any habitats were highlighted. Also, there are low to no levels of faunal biodiversity. There is no indication of the presence of threatened or protected flora or fauna species at the proposed	The increase in ground shade and humidity may promote growth of vegetation which can open opportunities for agrivoltaic farming. This impact is positive and long-term.	The impact of this stage may be determined by the activities designated during operational aspects of the farm.

	site for construction. The impact is localized, long term, with low intensity due to the disturbed conditions and zone in which the site is located. The impact is considered minor.	Another potential impact may be the reflection of solar panels may have on birds as the main wildlife in the surroundings, and transmission lines may affect bird mortality. The effects will be long term and localized. Solar PV farms can impact bird communities through habitat loss and the risk of avian collision mortality. An extrapolated mortality study based on a bird density of 38 to 50 species per ha (15 to 20 species per acre) may occur 4.5 bird fatalities per MW per year (Visser, Elke et. al 2019). A PV plant with 50 acres area or 10 MW is expected to impact 45 bird fatalities per 10 MW per year in a modest projection. Future data is needed to have a better accuracy in bird density and to understand the risk of PV solar energy developments on birds.	

		The impact can be considered moderate.	
		Noise level	
	Noise generated by construction workers and machinery is more likely to impact wildlife in the surrounding areas of the site. The effects are limited to the project site and immediate surroundings. Due to the low faunal biodiversity at this site and industrial development, this impact is considered minor.	Due to the isolated location of the site and barriers (to be established), this impact will be localised and mitigable. It is considered minor.	Noise generated by construction workers and machinery is most likely to add to existing noises in this phase. These noises are not likely to impact wildlife as there may have been migration from this area after a prolonged presence. Any potential impacts will be temporary and localised. This impact is considered minor.
	Aesthetics		
	The increased traffic during construction may increase the heavily used major road for other large-scale operations. This impact is considered temporary and minor.	The presence of a solar PV farm in this area may not have an impact this aspect as it is not within areas designated for any type of activity. This impact is noted as long-term and insignificant.	The increased traffic during construction may increase the heavily used major road for other large-scale operations. This impact is considered temporary and moderate.

Site	Construction Phase	Operation	Decommissioning
	Demography		
Hampshire			
	During the construction phase, an increase in population is expected in the area. While residents are expected to take part in some construction activities, there may be an influx of workers with specific skills. The effects are considered temporary, and localized. In general, this will bring a positive socio-economic impact to the area. However, demographics are not expected to be significantly impacted during this stage. The impact can be considered as minor.	Operation of the PV systems requires little staff. Additionally, maintenance and operational activities are expected to be carried out by GPL staff residing the areas of influence. The effects will be long term, localized but insignificant as it is not expected to change the demography of these areas. The impact is considered minor.	Decommissioning activities will need to ensure the quality of the GPL service is not affected negatively. In such case, the removal of the system is more likely to have an impact in the socio-economic activities of the area and its demography. To this assessment, it is assumed that GPL service after decommissioning will be maintained, therefore, decommissioning of the system is not considered to have a significant impact.
	Socioeconomics		

	Increased activities due to construction will temporarily increase the economic activities within proximity to the construction sites to accommodate the current needs of the workers. This impact is considered positive and minor.	An expected indirect impact of the operation of the PV systems is the increase of population in the area. The increase of energy production with the current reliable service from GPL, will naturally promote an expansion of socio-economic activities in the area thus also impacting the demography. This effect is considered high spread, long term and significant for the community. The impact is considered major.	An influx of construction workers will increase economic activities within the area temporarily. This impact is considered positive and minor.

Site	**Construction Phase**	**Operation**	**Decommissioning**
	Employment		
Hampshire			
	During the construction phase, employment opportunities will be generated for skilled and unskilled labour. There will also be a demand	The operation of the PV systems will be managed by GPL staff, however permanent roles like security services and scheduled upkeep. Therefore, a direct	During this phase, there may be temporary employment opportunities during the dismantling of the plant. However, this is

	for local goods and services which will have an impact on the earning capacity of local businesses. These impacts while positive are expected to be only temporary and localized. The impact is considered minor.	impact on employment generation is expected during this phase. This impact is considered minor.	expected to be in a much lesser extent than in the construction phase. The impact is considered minor.
	Socioeconomic activities		
	This impact is insignificant at this phase.	An indirect impact of the operation of the PV systems is the increase of employment in the district. The expected improvement on the reliability of the GPL service, will naturally promote an expansion of socio-economic activities in the area thus impacting employment opportunities. This impact is considered major. Additionally, the Programme intends to finance training and apprenticeships in solar PV installation and energy management projects which will be designed for diversity and inclusion, targeting women and persons with disabilities, adding to	This impact is negligible at this phase considering the Government of Guyana's long-term plans for low-cost energy generation.

		specific job skills and thereby employment within the sector. This effect is considered high spread, long term and significant for the community.	

Site	Construction	Operation	Decommission
	Displacement		
Hampshire	No competing interests were uncovered during acquisition of this site. However, during the environmental and social surveys, three unlawful structures utilised for residency were observed. This may likely result in the displacement of the individuals utilising these structures upon commencement of works.	This impact is not likely to occur during this phase.	This impact is not likely to occur during this phase.

Site	Construction Phase	Operation	Decommissioning
	Livelihood		
Hampshire	This impact is negligible in this phase.	The construction and operation of the PV system will increase energy security and	It is assumed that GPL service after decommissioning will be

		access in the area and will support the development of a greener economy. It is highly likely the project economic activities will expand and diversify economies with employment opportunities and improving the quality of life in the community. The effects will spread at the community level and can be considered long term. There is also an anticipated positive effect on income generation opportunities for women. Furthermore, this sustainable form of electricity will contribute to funding for system upgrades, including digitization, improving overall system reliability and the resilience of GPL's Transmission and Distribution network. Renewed access to revenues originally dedicated to fuel and subsidies would also aid in the repayment of debts. This will allow GPL to provide increased value to its	maintained, therefore, decommissioning of the system is not considered to have a significant impact.

		customers through more reliable and affordable electricity service in Guyana. This impact is considered major.	

Site	Construction Phase	Operation	Decommissioning
	Social/cultural		
Hampshire	While there may be a temporary increase of construction workers in the area, the local customs, cultures, and social relations are not expected to be significantly impacted. There are no cultural sites or near to the project site. This impact is considered minor.	This phase of the PV systems will be managed by local GPL staff. There are no expected impacts on local customs, culture, and social relations directly related to the operation of the PV systems. This impact is considered insignificant.	There are no expected impacts on local customs, culture, and social relations directly related to the decommissioning of the PV systems. This impact is considered insignificant.

Site	Construction Phase	Operation	Decommissioning
	Infrastructure		
Hampshire	There is no expected disruption of energy or other services during construction activities. Any	During the operation of the PV system, the energy service is expected to be reliable. Modular PV systems are	For this assessment, it is assumed that GPL service after decommissioning will be maintained, therefore,

	Unexpected events would have a brief and widespread effect. However, effects can be minimized with adequate planning. Upgrading of the access road to the proposed site may create traffic disturbances. The use of any current trail should be considered and relevant stakeholders contacted to ensure no significant disruption of activities to local users. The impact is considered moderate.	resilient to disruptive events. If a module is damaged, the system remains operational. This will benefit the customers and will minimize power outage in the area. Water supply service is expected to be impacted positively, since power disruptions to the distribution system will also be minimized. Effects will be long term and at the community level. The impact is considered major.	decommissioning of the system is not considered to have any impact.

Site	Construction Phase	Operation	Decommissioning
	Health and safety		
Hampshire	During construction, there will be health and safety hazards on site and in surrounding area due to increase vehicular traffic, heavy machinery operation, excavation, and other	During operations, workers will be exposed to occupational hazards especially during maintenance. The probability of occurrence can be	Increased exposure to hazards is expected in the decommissioning activities. Strict adherence to health and safety procedures will minimize these effects.

	construction activities. The effects will be localized and temporary. However, the effects can be minimized by strict adherence of the approved safety procedures mandatory under the Laws of Guyana. Influx of construction workers may lead to increase in the prevalence of sexually transmitted diseases among the local population, as well as sexual violence. Considering that labour is expected to be filled locally, this concern can be regarded as low. However, health and awareness campaigns as well as a code of conduct indicating clear repercussions can minimize any potential effects. The impact is considered moderate.	minimized by strict adherence to occupational safety procedures. The impact is considered indirect and minor.	The impact is considered moderate.

Site	Construction Phase	Operation	Decommissioning
	Supply Chain Risk		
Hampshire	The solar PV supply chain is vulnerable to impacts like natural disasters, wars, pandemics, technical incapacities, individual company decisions, etc. which can impact project costs and management. This impact is considered medium as it is unpredictable and direct, however, it can only be expected during this phase. This impact can be reduced by greater understanding of price mechanisms and competition by the PEU to inform decisions about capital costs before hiring a Contractor.	This impact is not likely to occur during this phase.	This impact is not likely to occur during this phase.

b. <u>the trans frontier nature of the impacts i.e. does it cross country borders or boundaries;</u>

Response: Not applicable

c. <u>the magnitude and complexity of the impacts;</u>

Response: Not applicable

d. <u>the probability of the impacts;</u>

Response: Not applicable

e. <u>the duration, frequency and reversibility of the impacts; and</u>

Response: Not applicable

f. <u>Cumulative impacts with other projects: additional surveys and assessment may be required to determine whether existing projects in combination with the proposed project will have a significant cumulative effect on the receiving environment.</u>

Response: Not applicable

xii. Description of proposed environmental management and mitigation measures for all environmental, ecological and social impacts.

Table 7-1 : Environmental and Social Management Plan – Construction of the Hampshire Solar PV Farm

	Issue/ Impact	Mitigation Measures	Monitoring Indicators	Responsibility for Implementation	Responsibility for Monitoring	Estimated Cost (US$)
Air Quality	Dust generation	▪ Cover stockpiles to minimize dust generation. ▪ Suppress dust from construction, stockpiles and increased vehicular traffic by sprinkling water. ▪ Consider wind direction when stockpiling construction materials. Orientation will avoid downwind residences or sensitive locations. ▪ Implement vehicle speed control though signage and speed bumps, whenever necessary.	▪ PM monitoring ▪ Dust generation observation ▪ Complaints register	All contractors on site	Site Supervisor	5,000
	NO_x and CO_x emissions	▪ Maintain vehicles and on-site construction equipment regularly.	▪ Equipment maintenance records according to	All contractors on site	Site Supervisor	10,000

			schedule ▪ Vehicle fitness certificates			
	Noise	▪ Use padding/noise isolators for construction equipment and machinery. ▪ Carry out fixed noise sources or activities away from site boundaries, particularly boundaries close to sensitive environments. ▪ Maintain construction vehicles and machinery adequately. ▪ Use ear plugs or earmuffs for specific activities by workers, visitors and any individuals working in proximity to the works. ▪ Consult stakeholders (immediate surroundings of site) to plan activities accordingly.	▪ Monitoring of dB ▪ Complaints register ▪ Equipment maintenance records according to schedule ▪ Workers' compliance to H&S procedures ▪ Consultation records ▪ Environmental Annual Reports	All contractors on site	Site Supervisor	5,000
Soil	Topsoil loss	▪ Limit the removal of vegetation to the site footprint.	▪ ESMP Compliance	All contractors on site	Site Supervisor	15,000

		▪ Whenever possible, removed topsoil should be conserved and used for remediation of affected areas.	records ▪ Environmental Annual Report			
	Soil compaction and erosion	▪ Develop suitable drainage in consideration of the physical characteristics of the site. ▪ Plant grass or use of rocks under the solar panels is also recommended to reduce erosion at the drip line.	▪ ESMP Compliance records ▪ Environmental Annual Report	All contractors on site	Site Supervisor	
	Soil contamination	▪ Adequately dispose of waste materials. ▪ Provide bunded areas or secondary containment for storage of oil/fuel and/or any other hazardous materials or substances like batteries with 110% capacity of the stored material. ▪ Provide spill kits at strategic locations. ▪ Service construction vehicles and machinery regularly. ▪ Ensure that any vehicle maintenance is handled on impervious surfaces to	▪ Complaints register ▪ ESMP Compliance records ▪ Environmental Annual Report	All contractors on site.	Site Supervisor	

		avoid soil contamination. ▪ Treat or dispose contaminated soil with a commercial oil-absorbing product, if possible.				
Land Use (ROW)		▪ Current land use of the right-of-way (ROW) is considered road reserved commonly used for infrastructural works like installation of networks of the solar PV farm. ▪ The proposed transmission lines for interconnection of PV Farm to the grid and substations will be done within the existing ROW. ▪ It is proposed that the Hampshire Solar Farm be interconnected to the Canefield F3 13.9kV Load Feeder via a short 13.8kV Line (under 1km). Therefore, there is no expected modification of the land use of the proposed transmission lines at the site. The impact is considered insignificant.	▪ Complaints register ▪ ESMP Compliance records	All contractors on site.	Site Supervisor	

	Landscape and visual impact	▪ The site proposed for the proposed solar PV farm does not have any competing interests. However, grass is present and should be maintained, where possible. ▪ Consult with aeronautical authorities with regards positioning and direction of solar panels to avoid conflicts with flying airplanes.	▪ ESMP Compliance records ▪ Consultation meeting records	All contractors on site.	Site Supervisor	5,000
	Solid waste generation	▪ Dispose of waste in the authorized landfill as regulated by the local authority. ▪ Plan and coordinate with the local NDC/RDC to manage the increased volume expected to be generated from the site. ▪ Provide the site with adequate number of bins for the disposal of domestic waste. ▪ Burning of waste on-site is strictly prohibited. ▪ Ensure adequate arrangements are	▪ ESMP Compliance records ▪ Consultation records with solid waste management authorities. ▪ Complaints records ▪ Valid contract with solid waste collection	All contractors on site.	Site Supervisor	50,000

		made for the frequent collection of domestic, construction and hazardous materials. ▪ Provide bins to facilitate waste from food supply entrepreneurs within the proximity to the site. ▪ Clean and maintain site and immediate surroundings.	contractor. ▪ Existence of at least one container bin outside the project site where food services providers are located (if necessary).			
	Hazardous waste	▪ This phase is expected to produce much hazardous waste due to ongoing construction process which requires regular maintenance and servicing of machines and vehicles. ▪ A hazardous waste management plan must be developed by the contractor for spent oil, oily rags, grease, filters, etc. that will be used on site. ▪ Hazardous all hazardous materials on	▪ Compliance with hazardous waste management plan and Environmental Permit ▪ Environmental Annual Report where	All contractors on site.	Site Supervisor.	5,000

		site and dispose according to stipulations outlined Environmental Protection (Hazardous Waste Management) Regulations 2000 and Environmental Permit. ▪ Any oil from machines serviced should be collected and stored in a bunded area or secondary containment for storage of any hazardous materials or substances like batteries with 110% capacity of the stored material. ▪ Machines and parts should not be serviced or cleaned near to or in any standing water body.	quantities generated are recorded and intended method of disposal			
	Surface water pollution	▪ Design drainage for the site to minimize run-off and in consideration of any nearby water bodies. ▪ Monitor and maintain drainage system regularly. ▪ Provide adequate temporary sanitary	▪ ESMP compliance records ▪ Existence of temporary sanitary facilities	All contractors on site	Site Supervisor	30,000

		facilities for workers on-site while permanent facilities are constructed. ▪ Ensure frequent collection of waste generated by sanitary facilities by an EPA approved contractor. ▪ Provide bunded areas or secondary containment for storage of oil/fuel with 115% capacity of the stored material.	▪ Valid contract with waste collection contractor			
	Groundwater pollution	▪ Clean oil spills, fuel spill and other site contaminants rapidly and immediately. ▪ Frequent collection of waste generated by sanitary facilities will be done by an EPA approved contractor. ▪ Provide bunded areas or secondary containment for storage of oil/fuel with 115% capacity of the stored material.	▪ ESMP compliance records ▪ Existence of temporary sanitary facilities ▪ Valid contract with waste collection contractor	All contractors on site	Site Supervisor	
	Loss of natural	▪ At the site proposed for the Hampshire solar PV farm, the natural	▪ dB monitoring	All contractors on site	Site Supervisor	500

	habitat	habitat was previously disturbed by agricultural activity. ▪ Monitor and maintain noise levels as recommended by the EPA Noise Regulations to minimize potential effects to fauna in the surrounding areas i.e., Construction ▪ 90dB daytime limits (06:00 – 18:00h) ▪ 75dB night-time limits (18:00 – 06:00h ▪ Ensure the Fauna Rescue Plan is consulted if any animal is encountered.				
	Demography and Employment	▪ Maximise the local labour market. ▪ Ensure the recruitment process is transparent.	▪ Employment records ▪ Number of local labours employed at the site	All contractors on site	Site Supervisor	1,000
	Displacement	▪ A thorough analysis of project alternatives must be carried out to	• A reasonable	PEU-GPL	PEU-GPL	To be determine

		identify solutions that are economically and technically feasible while eliminating or minimizing the need for involuntary resettlement.	estimate of the numbers of people likely to be affected, and an estimate of the costs of resettlement. • Attention must be given to socio-cultural considerations like cultural or religious significance of the land, the			d

			vulnerability of the affected population, or the availability of in-kind replacement for assets. • See section 5.1.2 for detailed recommendations.			
	Socio-cultural	▪ Regularly consult with the community through meaningful stakeholder consultation.	▪ Monthly community consultation records	All contractors on site	Site Supervisor.	5,000
	Infrastructure	▪ Ensure timely and adequate public announcements with regards to any service interruption because of the project, including road closures if	▪ Service interruption records. ▪ Duration of	All contractors on site.	Site Supervisor.	5,000

		necessary.	service interruption.			
	Health and Safety	▪ A health and safety plan should be implemented by the contractor on site. ▪ Workers' awareness sessions on health and safety issues should be carried regularly. ▪ Provide awareness campaigns to the population and training to workers on the mitigation of any potential community health and safety impacts. ▪ All personnel on site must be provided with PPE. ▪ Site emergency response plans should be developed including a fire safety plan. ▪ Provide adequate fire-fighting equipment on site. ▪ Ensure clear, visible signage throughout the site and surrounding	▪ H&S Plan compliance records. ▪ H&S awareness sessions attendance records. ▪ Site emergency response and Fire Safety plans developed and implemented. ▪ ESMP compliance records. ▪ Visible traffic and speed signage.	All contractors on site.	Site Supervisor.	20,000

		areas always. ▪ Traffic control and speed limits must be observed. ▪ Limit work hours to daytime limits (06:00-18:00h), unless otherwise agreed with relevant stakeholders. ▪ If work needs to be completed during the evening, night-time limits are (18:00 -6:00h). ▪ Occupational hazards should be marked on site and staff trained on hazard recognition. ▪ Cleanliness of the site must be always maintained.				
	Health: HIV/AIDS	▪ Use code of ethics, conduct, and good practices based on existing GPL standards and guidelines. ▪ Training on awareness, and education on safe practises in the workplace during the period of construction must be done. ▪ Equip staff with appropriate	▪ Compliance with the code of ethics ▪ Behaviours which facilitate unintentional injuries and violence,	Health and Safety Officer. Program should be adapted to comply with local laws.	Health and safety officer	3,500

		equipment and materials to protect colleagues from the risk of exposure to STIs. ▪ Disseminate information on safe practises including occupational health and first aid training.	▪ Tobacco use, ▪ Alcohol and drug use, ▪ Sexual behaviours related to pregnancy and sexually transmitted diseases, ▪ Unhealthy dietary behaviours, and ▪ Physical inactivity and being overweight.			
	Supply chain	• Ensure that there is greater understanding of price mechanisms and competition by the PEU to inform decisions about capital costs before hiring a	▪ International price comparisons ▪ Reputation of suppliers and	PEU-GPL	GPL	0

		Contractor. ▪ Research suppliers and products for adequate quotations.	products			

xiii. A summary of minutes of any public consultations/ meetings held by the Project proponent with key stakeholders expressing their views and opinions.

SUMMARY OF MINUTES

The consultation meeting related to the above-mentioned project was conducted with the community members, as it was seen that they are the most crucial part of the implementation of the project; whilst taking into consideration the social and environmental impacts of such a project, as well as issues surrounding land ownership. All other relevant stakeholders were invited, and the meeting was held on Tuesday, 14th June 2022 in the NDC Boardroom, Albion Sports Complex, Berbice. The meeting was called to order at 2:00 PM with 18 signed attendees.

MATTERS ARISING FROM THE MEETING:

Tendering of Project: Mr. Dillawar indicated that the project would be tendered publicly and internationally.

Location of the project: Mr. Dillawar referenced the map in his presentation, pointing out the landmarks in the area. Fifteen acres of land were allocated for the project. He indicated that there is still land in the Hampshire available for development.

No backup system, what would happen in a case of blackout: Mr. Dillawar explained that the project is meant to add to the grid therefore, GPL's generators would be used during the nights which will in turn, reduce fuel costs. Since the peak demand for power is 140 MW when connected to the DBIS, the addition to the grid will reduce fuel costs during operational hours.

Scope of the Hampshire project: There would be 2 connections in Berbice. One that connects to the public road in Hampshire and another in Prospect, Berbice which would connect to the cane field powerplant.

Benefit for Skeldon: Mr. Dillawar indicated yes; the power will go where it is needed.

Benefits for residents during the day: Mr. Dillawar indicated that the project would benefit the grid during the day, most importantly there are no issues with the stability of power. When the energy from the solar power reduces, the GPL generators would be able to compensate.

Addition of batteries later in the project: Mr. Dillawar indicated that it would be possible, and it can be built when needed.

Destruction of access road: Mr. Dillawar indicated that the new road would be used to transport materials for the construction of the project. He indicated that they do not foresee any major issues with the road but if there are it would be repaired. If residents are not satisfied, they can reach out using the Grievance mechanism.

Proximity of house lots in relation to dust: Mr. Dillawar highlighted that the issue with dust would only be during construction. After construction, dust would not be an issue because the panels would be on a bricklayer. In addition, if there is a dust issue, it would affect the solar panels because it means that there would be less power produced.

Length of time for construction: Mr. Dillawar indicated that it would be 12 – 18 months to complete all the sites in Berbice. The teams to complete construction would be rotating to complete the three sites in Berbice.

Benefits of the project to residents, in relation to cost: Mr. Dillawar explained that the solar power project feeds directly into the grid, which is a small portion of the larger system, it would reduce approximately 2% of the fuel purchased for power generation. This would assist GPL to keep the tariff stable in the cases of rising fuel prices and assist the operational cost of GPL. It was also communicated that in different parts of the country, the cost of electricity varies on how the fuel reaches the location.

Concerns about the damaging of appliances by the fluctuation of power: Mr. Dillawar indicated that customers can lodge a formal complaint with GPL where investigations can be done. Mr. Dillawar also indicated that appliances lose value over time, therefore persons may not receive the compensation for the original cost of the item.

Solar project locations in Berbice: Mr. Dillawar indicated that the locations of the projects are Hampshire which would feed power into the Hampshire feeder on the public road, Prospect which would feed power into the Canefield substation and Trafalgar which would feed power into the Onverwagt substation.

ANY OTHER BUSINESS: One resident inquired about what to do if they have an estimated bill, Mr. Dillawar explained why they may be having an estimated bill and encouraged persons to snap a picture of their meter and send it to GPL's WhatsApp number. They can also carry the information to the office.

Another resident enquired about streetlights, it was highlighted that streetlights are not the responsibility of GPL but that of the Ministry of Public works and Infrastructure.

CLOSING REMARKS: Mr. Dillawar extended gratitude to the attendees for their participation and encouraged persons to sign the attendance sheet. He also assured them that they would know when the project is in progress. All concerns would be considered for the project. Mr. Dillawar made his contact number available in the case persons may have questions about the project.

xiv. A description of any assumptions, uncertainties and gaps in knowledge.

NA

xv. A non-technical summary of the project (a summary of what the project is about in layman's language that clearly describes your project).

Funds from the Guyana-Norway Partnership will be utilized to execute a National Solar PV Project aligned with its plans to increase renewable energy penetration and grid stability in the power system. The project will be administered through the Inter-American Development Bank (IDB), with GPL as the Executing Agency. The execution of the projects that are a part of this program will support Guyana's transition to renewable energy and the diversification of the energy matrix via the use of cleaner and renewable energy sources in the electricity generation mix. Eight projects are currently proposed under Component 1: three sites (Prospect, Hampshire and Trafalgar) are vacant agricultural fields owned by the Government, to avoid land conflicts; two sites are former mining sites, those are Dacoura and Retrieve) in Linden; two sites are located on vegetated areas (Block 37 and Onderneeming) being the only feasible technical option for the respective areas, and one site in Charity.

The project will consist of 33MWp solar PV in three different grids as follows:

- ✓ 15MWp of Solar PV with a minimum of 22MWh (11MW, 2h) of battery storage for the

Linden Isolated System.

- ✓ 8MWp of Solar PV with a minimum of 12MWh (6MW, 2h) of battery storage for the Essequibo Coast Isolated System.
- ✓ 10MWp of Solar PV for the Demerara-Berbice Interconnected System, specifically in Berbice.

Benefits

The development of a National Utility Scale Solar PV Program will generate benefits including:

- **Economic**

a) Diversification of the local economies within each proposed project area and overall, nationally due to a more reliable, stable form of electricity

b) Increase resilience to the volatility of the global fuel market:

- ✓ The diversification of the energy generation matrix of these grids will result in operational and maintenance cost savings for GPL.
- ✓ Significant reduction in Government subsidies which can be used for:
- ✓ System upgrades, including digitisation, improving overall system reliability and the resilience of GPL's and LECI's Transmission and Distribution networks.

Thereby, allowing GPL and LECI to provide increased value to their customers through more reliable and affordable electricity services in Guyana.

- **Social and Gender**

a) Improved efficiency in the health, education, water, and public safety sectors

b) Employment during construction and operation

c) Local training and institutional capacity

- **Environment**

a) Contribution to the mitigation of global climate change by reduced emissions of Greenhouse Gases.

b) The reduction and avoidance of CO2 emissions in electricity generation via the diversification of the energy supply matrix with the introduction of renewable energy-based sources of energy specifically,

- Linden is purposed to conserve 17,259 tCO2 (valued = US$1.04M).
- Essequibo will conserve 9,390 tCO2 (valued = US$1.04M).
- Berbice will save 10,671 tCO2 (valued = US$0.64M).

c) Reduction in the consumption of and dependence on fossil fuel for electricity generation.